DOCKET NO. D-70-72-2

DELAWARE RIVER BASIN COMMISSION

Cabot Corporation
Industrial Wastewater Treatment Plant Upgrade Project
Colebrookdale Township, Berks County and Douglass Township,
Montgomery County, Pennsylvania

PROCEEDINGS

This docket is issued in response to an application referred to the Delaware River Basin Commission (DRBC or Commission) on March 25, 2004 by Cabot Corporation (Cabot), formerly known as Cabot Performance Materials, for the proposed improvements to its existing Industrial Waste Treatment Plant (IWTP). On _____, the Pennsylvania Department of Environmental Protection (PADEP) issued its National Pollutant Discharge Elimination System Permit (NPDES) No. PA0011266 and an Administrative Consent Agreement that contains a construction schedule for the improvements to the IWTP. No expansion of the IWTP capacity is proposed. The project is subject to construction approval by the PADEP via a Wastewater Management Permit.

The application was reviewed for approval under Section 3.8 of the *Delaware River Basin Compact*. The Berks and Montgomery County Planning Commissions have been notified of pending action. A public hearing on this project was held by the DRBC on October 27, 2004.

DESCRIPTION

Purpose. The purpose of this project is to make improvements and upgrades to the docket holder's existing 0.222 million gallons per day (mgd) IWTP, which discharges to Swamp Creek, locally known as West Swamp Creek.

Location. The project is located off Swamp Creek Road and straddles the borders of Douglass Township, Montgomery County and Colebrookdale Township, Berks County, Pennsylvania.

The Cabot discharge outfalls are located in the Schuylkill River Watershed as found on the "Sassamansville, PA" USGS quadrangle map as follows:

OUTFALL NO.	LATITUDE (N)	LONGITUDE (W)
001 (process wastewater, lagoon underdrain and non- contact cooling water)	40° 20’ 39”	75 ° 37’ 01”
002 (storm water, condensate, non-contact cooling and heating water)	40° 20’ 40”	75° 37’ 01”
003 (process water treatment system wastewater)	40° 20’ 42”	75° 37’ 00”

The project wastewater will continue to discharge from existing outfalls to Swamp Creek at River Mile 92.47 – 32.3 – 12.9 – 12.6. Swamp Creek is classified by PADEP as Potable Water Supply (PWS), supporting Trout Stocking Fishery (TSF) and Migratory Fish (MF) passage.

Area served. The project will continue to serve only the Cabot Corporation, Boyertown facility.

Physical features.

a. **Design criteria**. Cabot’s Boyertown facility is engaged in the production of nonferrous metals, nonferrous alloys and inorganic chemicals. The existing 0.222 mgd IWTP treats process wastewaters prior to discharge to Swamp Creek. The improvements to the IWTP are designed to provide treatment for 0.222 mgd of process wastewater. The design loadings to the facility are based on estimated plant production capacity in the year 2008. The fluoride treatment capability is designed for a maximum design flow of 154 gpm and an average concentration of 7,300 mg/l (13,500 lbs/day). If the fluoride concentration exceeds the design average concentration, the flow rate through the treatment plant will have to be reduced accordingly. The raffinate solidification system is designed for a flow rate of 10,000 gallons per day and is based on the current ore usage and existing KTaf production capacity. The process is designed to treat raffinate with fluoride concentrations in the range of 90,000 – 200,000 mg/l (see Cabot application attached to its letter dated March 24, 2004). The Spalt Rinse system will collect the water from the initial spalt and salt rinses, may be utilized in the secondary crystallization process and then be treated to recover tantalum. After tantalum recovery, the water will either be sent off site for disposal and/or pumped to the IWTP to maintain compliance with Total Dissolved Solids (TDS).

b. **Facilities**. The existing wastewater treatment system consists of chemical/physical operations designed to remove fluoride, metals and suspended solids. These operations include wastewater collection, chemical treatment with lime and separation of precipitated solids using filter presses. Effluent from the treatment system is discharged to on-site lagoons for hydraulic equalization, storage and pH adjustment. The proposed improvements to the IWTP include physical/chemical treatment operations for fluoride and heavy metals. They also include equalization, chemical feed, filtration and sludge dewatering. In addition, the proposed improvements of the treatment plant will allow for segregation and separate treatment of the raffinate and spalt rinse waste streams.

c. **Other**. The docket holder withdraws an average flow of 0.228 mgd from Swamp Creek for its process water and has a DRBC Entitlement (No. 384) for up to 2.551 mg/month (consumptive use), plus 6.126 mg/month (non-consumptive use) for a total of 8.68 mg/month withdrawal for consumptive and nonconsumptive uses. The Entitlement was transferred from Kawecki Berylco Industries, Inc. to Cabot Corporation on May 4, 1995. Two on-site wells that were described in Docket No. D-75-24, can supply up to 0.06 mgd, but are only used for firefighting training and emergency firefighting. These wells are located in the Southeast Pennsylvania Groundwater Protected Area.

Sanitary sewage flows from the Cabot facilities will continue to be routed to the Berks-Montgomery Municipal Authority Sewage Treatment Plant.

The tops of the project facilities are above the 100-year flood elevation. Emergency power is not to be provided for use during a power outage, as the docket holder has ample post treatment effluent storage capacity to avert related problems.

Sludge from the wastewater treatment plant is disposed of at a state-approved residual waste landfill.

NPDES Permit No. PA0011266, issued by PADEP on _____, includes interim and final effluent limitations for the project discharge from outfalls 001, 002 and 003 to Swamp Creek. The docket holder will discharge from outfall 001 if a minimum dilution ratio of 30 to 1 (Swamp Creek flow to outfall 001 flow) can be achieved and will also comply with the following interim effluent conditions until the completion and start-up of the facilities in accordance with Decision section Condition II. r.

Interim Effluent Limits - Outfall 001 (based on an interim flow of 0.1763 mgd)*

PARAMETER	LIMIT**
pH (Standard Units)	6 to 9 (at all times)
Total Suspended Solids	20 mg/l (85% minimum removal)
Nitrite and Nitrate (as N)	100 mg/l

PARAMETER	LIMIT**
Fluoride	55 mg/l
Sulfate	5,600 mg/l
Chloride	6,700 mg/l
Total Dissolved Solids	15,000 mg/l

Upon completion and start-up of the improvements/upgrade facilities in accordance with Decision section Condition II. r., the docket holder shall meet the final limits for outfall 001 as listed below:

PARAMETER	LIMIT**
pH (Standard Units)	6 to 9 (at all times)
Total Suspended Solids	20 mg/l (85% minimum removal)
Ammonia, as N	6 mg/l
Total Dissolved Solids	10,210 mg/l
Sulfate	7,200 mg/l
Chloride	7,834 mg/l
Nitrite and Nitrate, as N	110 mg/l
Oil and Grease	15 mg/l
Fluoride	34 mg/l
Total Residual Chlorine	0.5 mg/l
Zinc, Total	0.638 mg/l
Copper, Total	0.05 mg/l
Molybdenum, Total	0.183 mg/l
Osmotic Pressure	330 MOs/kg
Lead, Total	0.027 mg/l
Nickel, Total	0.032 mg/l

The following limits apply for outfall 002 (storm water and non-contact cooling water):

Outfall 002 (based on a flow of 0.0404 mgd)*

PARAMETER	LIMIT**
pH (Standard Units)	6 to 9 (at all times)
Total Suspended Solids	20 mg/l (85% minimum removal)
Ammonia (as N)	6 mg/l
Total Dissolved Solids	650 mg/l
Sulfate	100 mg/l
Chloride	300 mg/l
Nitrite and Nitrate	2 mg/l
Phosphorus, as P	2 mg/l

PARAMETER	LIMIT**
Dissolved Oxygen	5 mg/l (at all times)
Fluoride	40 mg/l
Total Residual Chlorine	0.5 mg/l
Temperature	110^{o} F

The following limits apply for the discharge from outfall 003 (process water treatment system reject water):

Outfall 003 (based on a flow of 0.0603 mgd)*

PARAMETER	LIMIT**
pH (Standard Units)	6 to 9 (at all times)
Total Suspended Solids	30 mg/l (85% minimum removal)
Aluminum, Total	4 mg/l
Total Dissolved Solids	550 mg/l
Sulfate	120 mg/l
Chloride	50 mg/l
Nitrite and Nitrate	4 mg/l
Fluoride	3 mg/l
Iron, Total	2 mg/l
Manganese, Total	1 mg/l
Total Residual Chlorine	0.5 mg/l

*Flow values are for information only and do not constitute an enforceable limit.
**Monthly average discharge limits.

Cost. The overall cost of this project is estimated to be $10,000,000.

Relationship to the Comprehensive Plan. The project wastewater treatment plant will continue to discharge to Swamp Creek in the drainage area of the Schuylkill Scenic River Designation that was included in the Comprehensive Plan as a Recreational Area on July 26, 1978.

FINDINGS

Cabot's Boyertown facility is engaged in the production of nonferrous metals, nonferrous alloys and inorganic chemicals, and has indicated that it is the only manufacturing operation of its kind in the United States. It produces products of strategic importance to the U.S. government, as well as essential products for the medical, telecommunications and electronics fields. Tantalum is produced by processing ore with hydrofluoric acid (HF), followed by

extraction of the ore leachate with methyl isobutyl ketone (MIBK) and deionized water. This refractory metal is then further refined and processed to produce inorganic compounds and pure tantalum metal.

Water used by the plant for manufacturing operations is drawn from Swamp Creek and is treated prior to plant use. Filter backwash and reverse osmosis (RO) reject wastes from this system are returned to Swamp Creek via outfall 003. Cabot segregates storm water, non-contact cooling water and steam condensate. These discharges are conveyed to a storm water treatment/holding system prior to discharge to Swamp Creek via outfall 002.

Process wastewaters of up to 0.222 mgd are treated on-site and are discharged after treatment to Swamp Creek via outfall 001. These wastewaters are considered "Categorical" by the United States Environmental Protection Agency (USEPA) Effluent guidelines for Cabot's standard industrial classification, as a primary non-ferrous metals refining and industrial organic chemicals. The improvements/upgrade to the Cabot's Boyertown Facility are designed to achieve a final average fluoride effluent limit of 34 mg/l, which meets the USEPA's Best Available Treatment (BAT) technology limit for fluoride. In addition to this technology-based limit, Cabot would have to meet the Commission and PADEP in-stream water quality objectives based potable drinking water standards and upon a regulatory low stream-flow ($Q_{7\text{-}10}$) that is associated with drought.

DRBC Docket No. D-75-24, approved on November 30, 1977, required Cabot to restrict in-stream fluoride concentrations to less than 1 mg/l after mixing, which was developed in support of PADEP's requirements. PADEP has since amended its Water Quality Requirements (Chapter 96) to provide an exception to Section 96.3 (c) requirements. Section 96.3 (d) reads "[a]s an exception to subsection (c) the water quality criteria for total dissolved solids, nitrite-nitrate nitrogen, phenolics, chloride, sulfate and fluoride established for the protection of potable water supply shall be met at least 99% of the time at the point of existing or planned surface potable water supply withdrawals unless otherwise specified in this title".

By letter dated November 14, 2002, the Executive Director of the DRBC issued a determination, subject to PADEP concurrence, that reads "[t]he permitee shall discharge its TDS loading in proportion to the streamflow of the Swamp Creek in such a manner that the concentration of TDS will not exceed 1,500 mg/l after complete mixing at all times". The Executive Director noted that during the $Q_{7\text{-}10}$ the national secondary drinking water limit of 500 mg/l would be met 3.9 miles downstream of the discharge, and that the nearest public drinking intake was located approximately 25 river miles downstream. In addition, monitoring during the July 2002 drought conditions concluded that there was no statistical difference in the aquatic community between the sampling locations that were upstream and downstream of the Cabot outfall.

Included with Cabot's permit and docket applications submitted to PADEP and the Commission, was an analysis to support requested adjustments to the requirements contained in the existing Commission and PADEP docket and permit conditions for TDS, fluoride and nitrite-nitrate nitrogen. In the case of Swamp Creek, the Commission and PADEP use a $Q_{7\text{-}10}$ equal to 1.4 mgd (2.12 cfs), which is the lowest seven consecutive day streamflow average that occurred during the most recent ten-year record. The ratio of this low flow to the average design process wastewater discharge from the project plant is 6.3 to 1. The analysis submitted with Cabot's application indicates that at Swamp Creek's mean low flow of 2,752 gpm, the Basin-wide fluoride concentration of less than 2 mg/l would be achieved Basin wide under average loading conditions and within 3.88 miles of the outfall 001 under maximum loading conditions. (Loading conditions refers to effluent loadings discharged from the Cabot outfalls.) During a $Q_{7\text{-}10}$ flow rate of 1.4 mgd, the in-stream water quality objective of 2 mg/l would normally be achieved in a distance of less than 3.6 miles of the Cabot outfall 001.

In addition, Cabot has indicated that the discharge, after construction and startup of the IWTP upgrades project, will comply with USEPA BAT requirements, has evaluated and determined that in-plant process changes to further reduce the levels of the above three parameters in its effluent are not feasible, and that treatment costs to meet the nitrite-nitrate limit, if feasible, alone would be an additional $3.5 million dollars. Cabot has also indicated that their evaluation of alternative proprietary technologies found them to be unsuccessful in meeting the Commission fluoride limit of 2 mg/l. They further indicated that the chloride and aluminum components of the treatment chemicals would cause the Cabot discharge to exceed PADEP limits for these constituents.

The nearest surface water intake of record for public water supply downstream of the project discharge is operated by Aqua America, Inc., formerly known as Philadelphia Suburban Water Company, approximately 24.6 river-miles downstream on Perkiomen Creek. The analysis submitted by Cabot indicates that its discharge will meet the in-stream water quality objective for fluoride of 2 mg/l within 3.6 river-miles from its outfall, upon the implementation of the proposed improvements/upgrades to the treatment facilities. The analysis also indicates the Cabot discharge will meet the water quality objective for nitrite/nitrate of 10 mg/l at a point that is 5.5 river-miles downstream from the discharge point. This analysis excludes the benefit (dilution flow) from the Berks-Montgomery Municipal Authority STP, which discharges to Swamp Creek approximately 1 river-mile downstream from Cabot.

The proposed project is designed to produce a discharge meeting the effluent requirements set forth in the *Water Quality Regulations* (WQR) of the DRBC with the considerations discussed above. PADEP and the Commission have reviewed the analysis and agree with the findings and have incorporated effluent limits for TDS, fluoride and nitrate-nitrate nitrogen into the NPDES Permit issued on _____, and this docket that meet PADEP and Commission requirements, and will not cause an adverse impact to aquatic life.

This docket includes adjustments to standard Basin wide requirements allowable under the Commission's WQR. A final effluent limitation TDS of 10,210 mg/l has been required in this docket in accordance with WQR Section 3.10.4.D.2 and as provided in the Executive Director's November 14, 2002 determination. PADEP's Water Quality Standards Implementation Chapter 96.3.(d) provides an exception to the meet the water quality requirements to Chapter 96.3.(c) for TDS, nitrite-nitrate nitrogen and fluoride established for the protection of potable water supply. It provides that such requirements be met at least 99% of the time at the point of all existing or planned surface potable water supply. PADEP has issued an NPDES incorporating considerations under Chapter 96.3 (d). This docket also incorporates the limits for fluoride and nitrite-nitrate nitrogen as included in the PADEP NPDES permit. The Cabot discharge will meet these requirements and will not impact any interstate waterways (Section 4.20.4 of the Commission's WQR). In addition, the Commission agrees that the Nuclear Regulatory Commission (NCR) requirements placed on the facility discharge are more stringent than the Commission's radioactivity criteria and has included the NRC requirement for Alpha, Beta and Radium (totals) in the docket and these requirements will be used in lieu of DRBC criteria.

The project does not conflict with the Comprehensive Plan and is designed to prevent substantial adverse impact on the water resources related environment, while sustaining the current and planned future water uses and development of the water resources of the Basin.

DECISION

I. Effective on the approval date for Docket No. D-70-72-2 below, Docket Nos. D-70-72 and D-75-24 are rescinded and replaced by Docket No. D-70-72-2.

II. The project and appurtenant facilities as described in the Section entitled "Physical features" above are approved pursuant to Section 3.8 of the *Compact*, subject to the following conditions:

a. Docket approval is subject to all conditions, requirements and limitations imposed by the PADEP, and such conditions, requirements and limitations are incorporated herein, unless they are less stringent than the Commission's.

b. The facility and operational records shall be available at all times for inspection by the DRBC.

c. The facility shall be operated at all times to comply with the requirements of the *Water Quality Regulations* of the DRBC.

d. Withdrawal from the two on-site groundwater wells shall be restricted to emergency use for firefighting and firefighting training.

e. The docket holder shall pay for surface water use in excess of 2.551 mg/month (consumptive use) plus 6.126 mg/month (non-consumptive use) in accordance with the provisions of Resolution No. 74-6, as amended.

f. If the docket holder seeks relief from any limitation based upon a DRBC water quality standard or minimum treatment requirement, the docket holder must apply to the Commission for a docket revision in accordance with Section 3.8 of the *Compact*.

g. If at any time the receiving treatment plant proves unable to produce an effluent that is consistent with the requirements of this docket approval, the deficiency must be remedied in an expeditious manner with immediate and formal notice given to the DRBC and PADEP. Discharge Monitoring Reports (DMRs) that outline any such excursions and corrective actions may be submitted to the Executive Director to comply with this requirement.

h. Nothing herein shall be construed to exempt the docket holder from obtaining all necessary permits and/or approvals from other State, Federal or local government agencies having jurisdiction over this project.

i. Sound practices of excavation, backfill and reseeding shall be followed to minimize erosion and deposition of sediment in streams.

j. Within 10 days of the date that construction of the project has started, the docket holder shall notify the DRBC of the starting date and scheduled completion date.

k. Upon completion of construction of the approved project, the docket holder shall submit a statement to the DRBC, signed by the docket holder's engineer or other responsible agent, advising the Commission that the construction has been completed in compliance with the approved plans, giving the final construction cost of the approved project and the date the project is placed into operation.

l. This docket approval shall expire on December 31, 2007 unless prior thereto the docket holder has commenced operation of the subject project or has expended substantial funds (in relation to the cost of the project) in reliance upon this approval.

m. The area served by this project is limited to the service area as described above. Any expansion beyond this area is subject to review in accordance with Section 3.8 of the *Compact*.

n. Any requirements imposed by the National Pollutant Discharge Elimination System permitting agency shall supersede the requirements of this approval insofar as they impose more stringent treatment criteria.

o. The docket holder shall make wastewater discharge in such a manner as to avoid injury or damage to fish or wildlife and shall avoid any injury to public or private property. The docket holder shall assume all responsibility for any claims arising from the proposed discharges and shall indemnify and hold harmless the Commission against and from any and all claims made by or on behalf of any person arising from any discharges made by the docket holder.

p. Nothing in this docket approval shall be construed as limiting the authority of DRBC to adopt and apply charges or other fees to this discharge or project.

q. The issuance of this docket approval shall not create any private or proprietary rights in the water resources of the Basin, and the Commission reserves the right to amend, alter or rescind any actions taken hereunder in order to insure proper control, use and management of the water resources of the Basin.

r. The docket holder shall comply with the interim effluent limits for discharge from outfall 001, as specified in the "Physical features" - "Other" section, until December 31, 2007. Thereafter, the docket holder shall comply with the final effluent limitations for outfall 001 as specified in the "Physical features" - "Other" section of this docket. Construction of the improvements/upgrades are scheduled to begin seven (7) months after the issuance of the PADEP Water Quality Management Part II permit. The docket holder shall advise the Commission in writing (not to exceed 30 days of its becoming aware) of any delay that could cause it to miss compliance with the achievement of the final effluent limitations for outfall 001. The Executive Director, with good cause, after consultation with PADEP, may extend the date to comply with the final effluent limits for outfall 001.

s. The docket holder shall submit an annual report due on or before January 1 of each year starting on January 15, 2005 demonstrating that effluent discharges of TDS. Fluoride and nitrite-nitrate nitrogen do not cause exceedences of the instream water quality criteria of 500 mg/l TDS, 2.0 mg/l fluoride and 10 mg/l nitrite-nitrate nitrogen at a distance of 3.9 miles, 3.6 miles and 5.5 miles respectively from outfall 001. DMRs submitted to PADEP by the docket holder may be submitted to the Commission to comply with this requirement. Data collected and submitted to PADEP by the docket holder on a quarterly basis, supplemented with the fluoride data collected specifically for DRBC, may be used as a basis to demonstrate this requirement.

t. This docket approval shall expire on the expiration date indicated below unless the docket holder has submitted a complete application for renewal of this docket 12 months prior to the expiration date listed below, or permission has been granted by the DRBC for submission at a later date. In the event that a timely and complete application for renewal has been submitted and the DRBC is unable, through no fault of the docket holder, to reissue the docket before the expiration date, the terms and conditions of this docket will automatically continue and remain fully effective and enforceable pending the grant or denial of the application for docket approval.

BY THE COMMISSION

DATE APPROVED:

EXPIRATION DATE: October 27, 2009